



GRADE

5

# KENTUCKY

K-PREP

Kentucky Performance Rating For Educational Progress



## MATH SAMPLE ITEMS

Spring 2012

The following are the general guides that will be used to evaluate your responses to short-answer and extended-response questions in this test.

## Kentucky Short-Answer Questions General Scoring Guide

### Score Point 2

- You complete all components of the question and communicate ideas clearly.
- You demonstrate an understanding of the concepts and/or processes.
- You provide a correct answer using an accurate explanation as support.

### Score Point 1

- You provide a partially correct answer to the question and/or address only a portion of the question.
- You demonstrate a partial understanding of the concepts and/or processes.

### Score Point 0

- Your answer is totally incorrect or irrelevant.

### Blank

- You did not give any answer at all.

# Kentucky Extended-Response Questions

## General Scoring Guide

### Score Point 4

- You complete all important components of the question and communicate ideas clearly.
- You demonstrate in-depth understanding of the relevant concepts and/or processes.
- Where appropriate, you choose more efficient and/or sophisticated processes.
- Where appropriate, you offer insightful interpretations or extensions (generalizations, applications, analogies).

### Score Point 3

- You complete most important components of the question and communicate clearly.
- You demonstrate an understanding of major concepts even though you overlook or misunderstand some less-important ideas or details.

### Score Point 2

- You complete some important components of the question and communicate those components clearly.
- You demonstrate that there are gaps in your conceptual understanding.

### Score Point 1

- You show minimal understanding of the question.
- You address only a small portion of the question.

### Score Point 0

- Your answer is totally incorrect or irrelevant.

### Blank

- You did not give any answer at all.



1

Shawn simplified the expression  $3.8 \div 10^5$  correctly. Which statement describes how the decimal point moved in Shawn's simplified expression?

- A** 5 places to the right
- B** 4 places to the right
- C** 5 places to the left
- D** 4 places to the left

2

Mr. Mitchell drew polygon  $WXYZ$  as shown below. He knows the following information:

- Sides  $WZ$  and  $XY$  are equal in length.
- Sides  $WX$  and  $YZ$  are parallel.



Which hierarchy correctly describes polygon  $WXYZ$  ?

- A** Polygon  $\rightarrow$  quadrilateral  $\rightarrow$  kite  $\rightarrow$  isosceles trapezoid
- B** Polygon  $\rightarrow$  quadrilateral  $\rightarrow$  rectangle  $\rightarrow$  isosceles trapezoid
- C** Polygon  $\rightarrow$  quadrilateral  $\rightarrow$  trapezoid  $\rightarrow$  isosceles trapezoid
- D** Polygon  $\rightarrow$  quadrilateral  $\rightarrow$  parallelogram  $\rightarrow$  isosceles trapezoid





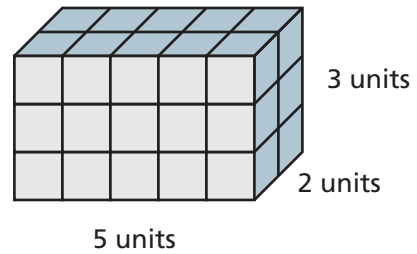
3

Elijah went to dinner and a school concert for  $3\frac{7}{12}$  hours. The concert lasted  $1\frac{2}{3}$  hours. How many hours was dinner?

- A  $1\frac{11}{12}$
- B  $2\frac{1}{12}$
- C  $2\frac{5}{12}$
- D  $2\frac{5}{9}$

4

The picture represents a rectangular prism filled with congruent unit cubes.



Which expression represents the volume, in cubic units, of the prism?

- A  $5 + 2 + 3$
- B  $(5 \times 2) \times 3$
- C  $5 + 2 + 3 + 5 + 2 + 3$
- D  $(5 \times 3) + (2 \times 3) + (2 \times 5)$



5

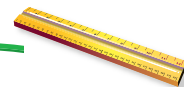
The table below shows the measurements of the human eye.

**Human Eye Measurements**

Measurement	Number of Inches
Back to front	0.94
Bottom to top	0.91
Side to side	0.94

Which statement correctly compares the side to side measurement with the bottom to top measurement?

- A**  $0.94 > 0.91$
- B**  $0.94 = 0.94$
- C**  $0.91 > 0.94$
- D**  $0.91 = 0.91$



6

At a grocery store, 3 employees each stacked 58 cans of peas and 64 cans of corn on a shelf, as represented by this expression.

$$(3 \times 58) + (3 \times 64)$$

**Part A** Using only addition symbols, write an equivalent expression to the one above.

**Part B** How do you know the equation you wrote in part A is equivalent to the expression above? Explain your thinking.

**RUBRIC**

<b>Score Point 2</b>	<ul style="list-style-type: none"> <li>You complete all components of the question and communicate ideas clearly.</li> <li>You demonstrate an understanding of the concepts and/or processes.</li> <li>You provide a correct answer using an accurate explanation as support.</li> </ul>
<b>Score Point 1</b>	<ul style="list-style-type: none"> <li>You provide a partially correct answer to the question and/or address only a portion of the question.</li> <li>You demonstrate a partial understanding of the concepts and/or processes.</li> </ul>
<b>Score Point 0</b>	<ul style="list-style-type: none"> <li>Your answer is totally incorrect or irrelevant.</li> </ul>
<b>Blank</b>	<ul style="list-style-type: none"> <li>You did not give any answer at all.</li> </ul>
<b>Note:</b> No part can be incomplete or incorrect and receive full credit.	

**Correct Answer**

**Part A:**  $58 + 58 + 58 + 64 + 64 + 64$  or any other equivalent expression

**Part B:** Student explains that  $3 \times 58 = 58 + 58 + 58$  and  $3 \times 64 = 64 + 64 + 64$ . Therefore,  $(3 \times 58) + (3 \times 64) = 58 + 58 + 58 + 64 + 64 + 64$  or any other similar explanation.



## Annotated Student Response

### SAMPLE 2-POINT RESPONSE

1. (A)  $(58+58+58)+(64+64+64)$

(B) I know that the equation I wrote in part A is equivalent to  $(3 \times 58) + (3 \times 64)$  because  $3 \times 58 = 174$  cans and  $3 \times 64 = 192$  and  $174 + 192 = 366$ . I also know that  $58 + 58 + 58 = 174$  and  $64 + 64 + 64 = 192$  and  $174 + 192 = 366$ .

My way		Original way	
$\begin{array}{r} 64 \\ 64 \\ 64 \\ \hline 192 \end{array}$	$\begin{array}{r} 58 \\ 58 \\ 58 \\ \hline 174 \text{ cans} \end{array}$	$\begin{array}{r} 58 \\ 3 \\ \hline 174 \text{ cans} \end{array}$	$\begin{array}{r} 64 \\ \times 3 \\ \hline 192 \text{ cans} \end{array}$

### ANNOTATION – 2-POINT RESPONSE

A The student writes the equivalent expression using only addition symbols.

B The student explains why the expression is equivalent.

**Overall**, the student earns 2 points.



## Annotated Student Response

### SAMPLE 1-POINT RESPONSE

1.  $(3 \times 58) + (64 \times 3)$   
A. An equivalent expression to the one above  
is  $58 + 58 + 58 + 64 + 64 + 64$ .

B. This is equivalent to  $(3 \times 58) + (64 \times 3)$ . I know  
this because  $58 \times 3$  is equal to  $58 + 58 + 58$ .  $58$  times  
3 is 174 the sum of  $58 + 58 + 58$  is 174.

### ANNOTATION – 1-POINT RESPONSE

A The student writes the equivalent expression using only addition symbols.

B The student demonstrates partial understanding by not completely explaining how the two expressions are equivalent. The student explains why  $58 \times 3$  is equivalent but does not address  $64 \times 3$ .

**Overall**, the student earns 1 point.



## Annotated Student Response

### SAMPLE 0-POINT RESPONSE

1. A. 
$$\begin{array}{r} 58 \\ + 3 \\ \hline 61 \end{array}$$
 
$$\begin{array}{r} 64 \\ + 3 \\ \hline 67 \end{array}$$

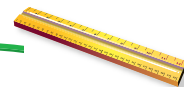
B. Because when you add  $58 + 3 = 61$  and when you add  $64 + 3 = 67$  and that is a equivalent.

### ANNOTATION – 0-POINT RESPONSE

A The student adds the given values.

B The student incorrectly explains how the above addition is equivalent.

**Overall**, the student earns 0 points.



7

Describe the relationship between the value of  $(126 + 9)$  and  $(126 + 9) \div 2$ .

**RUBRIC**

<b>Score Point 2</b>	<ul style="list-style-type: none"> <li>You complete all components of the question and communicate ideas clearly.</li> <li>You demonstrate an understanding of the concepts and/or processes.</li> <li>You provide a correct answer using an accurate explanation as support.</li> </ul>
<b>Score Point 1</b>	<ul style="list-style-type: none"> <li>You provide a partially correct answer to the question and/or address only a portion of the question.</li> <li>You demonstrate a partial understanding of the concepts and/or processes.</li> </ul>
<b>Score Point 0</b>	<ul style="list-style-type: none"> <li>Your answer is totally incorrect or irrelevant.</li> </ul>
<b>Blank</b>	<ul style="list-style-type: none"> <li>You did not give any answer at all.</li> </ul>
<b>Note:</b> No part can be incomplete or incorrect and receive full credit.	

**Correct Answer**

The value of the expression  $(126 + 9)$  is two times greater than the value expression  $(126 + 9) \div 2$  because  $(126 + 9) \div 2$  is half the value of  $(126 + 9)$ .





## Annotated Student Response

### SAMPLE 2-POINT RESPONSE

2. The relationship between the value of  $(126+9)$  and  $(126+9) \div 2$  is that one is 135, (which is  $(126+9)$ ) and the other is half of that,  $126+9=135$ .  $135 \div 2 = N$

$N = 67.5$        $N = 67.5$       So, the relationship of the two numbers is that one is half of the other.

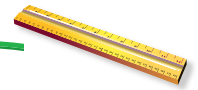
$$\begin{array}{r} 2 \overline{)135} \\ \underline{12} \phantom{0} \\ 15 \\ \underline{14} \phantom{0} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

### ANNOTATION – 2-POINT RESPONSE

The student states the correct relationship between the expressions and describes this relationship sufficiently.

**Overall**, the student earns 2 points.





## Annotated Student Response

### SAMPLE 1-POINT RESPONSE

2.  $(126 + 9)$  and  $(126 + 9) \div 2$   
are smaller because  
 $(126 + 9) \div 2$  is half of  $(126 + 9)$

### ANNOTATION – 1-POINT RESPONSE

The student states the relationship between the two expressions but does not show how the student knows the relationship between the two expressions.

**Overall**, the student earns 1 point.



## Annotated Student Response

### SAMPLE 0-POINT RESPONSE

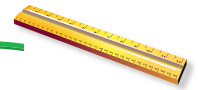
2.

The relationship between 1269  
and is that if add it you get the  
same answer but when you divid  
on of them you get a different  
answer

### ANNOTATION – 0-POINT RESPONSE

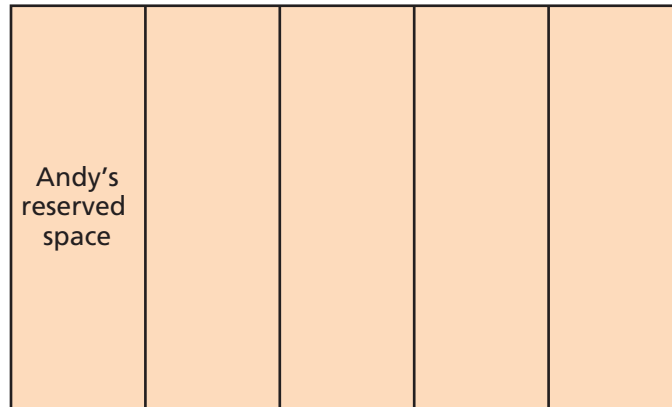
The student attempts to describe the differences between the two expressions but does so in an unclear manner.

**Overall**, the student earns 0 points.



The diagram below shows the area of the cafeteria floor space that was used for a craft show. Andy reserved  $\frac{1}{5}$  of the cafeteria floor space to display his crafts.

**Cafeteria Floor Space**



Andy divided his reserved space into 4 equal parts and displayed his paintings, woodworking, metalwork, and clay each in a different spot.

**Part A** What fraction of the cafeteria floor space did Andy use for paintings? Explain how to check your answer using multiplication. Show your work.

The next time Andy set up his craft display in the cafeteria he was given  $\frac{1}{3}$  of the cafeteria floor space. He divided his reserved space into 4 equal parts so he could display his paintings, woodworking, metalwork, and clay in different spots.

**Part B** What fraction of the cafeteria floor space did Andy use for paintings? Show your work.

**Part C** Use a visual fraction model to show the fraction of the cafeteria floor space that you determined Andy used to display his paintings in **part B**.

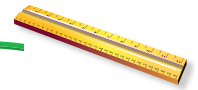


**RUBRIC**

<b>Score Point 4</b>	Student scores 4 points.
<b>Score Point 3</b>	Student scores 3 – 3.5 points.
<b>Score Point 2</b>	Student scores 2 – 2.5 points.
<b>Score Point 1</b>	Student scores 0.5 – 1.5 points. OR Student demonstrates minimal understanding of division of unit fractions by non-zero whole numbers.
<b>Score Point 0</b>	Student's response is totally incorrect or irrelevant.
<b>Blank</b>	No student response.
<b>Note:</b> No part can be incomplete or incorrect and receive full credit.	

**Score Points**

<b>Part a:</b>	score 1.5 points	correct answer with correct and complete work or explanation
	OR	
	score 1 point	correct answer with incomplete work
	OR	
	score 0.5 point	correct answer with no work
		OR
		incorrect answer due to a calculation error (work must be shown)
		OR
		some correct procedure
		OR
		vague explanation only
<b>Part b:</b>	score 1.5 points	correct answer with correct and complete work or explanation
	OR	
	score 1 point	correct answer with incomplete work
	OR	
	score 0.5 point	correct answer with no work
		OR
		incorrect answer due to a calculation error (work must be shown)
		OR
		some correct procedure
		OR
		vague explanation only
<b>Part c:</b>	score 1 point	correct answer with correct and complete work or explanation
	OR	
	score 0.5 point	correct answer with incomplete work or explanation
		OR
		incorrect answer due to a calculation error (work must be shown)
		OR
		some correct procedure



OR  
vague explanation only

**Correct Answer:**

**Part A:** Andy used  $\frac{1}{20}$  of the cafeteria floor space to display his paintings.

$\frac{1}{5}$  divided by 4 is  $\frac{1}{20}$ . Check:  $\frac{1}{20} \times 4 = \frac{4}{20} = \frac{1}{5}$ .

**Part B:** Andy used  $\frac{1}{12}$  of the cafeteria floor space to display his paintings.

$\frac{1}{3}$  divided by 4 is  $\frac{1}{12}$ .

**Part C:** A diagram of a rectangle divided into 4 equal sections with each of the smaller sections labeled  $\frac{1}{12}$ .

OR

$\frac{1}{3}$			
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

OR other models





# Annotated Student Response

## SAMPLE 4-POINT RESPONSE

NOTES

3. ④ He Used  $\frac{1}{20}$  of the cafeteria for his paintings  
I can prove this by multiplying 5 by 4 to get 20.

$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$

5 ← the amount  
x 4 ← the room  
20 WAS split  
↑ Up into.  
the Product the amount  
of split spaces  
in each  $\frac{1}{5}$   
of the cafeteria

③ This time he got  $\frac{1}{2}$  of the cafeteria  
for paintings.

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

3 ← the amount of  
space the  
x 4 ← the  
12 Cafeteria was  
↑ split up into.  
the Product the amount of  
space in  $\frac{1}{3}$ .

①

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

A 1.5

B 1.5

C 1.0

**ANNOTATION – 4-POINT RESPONSE**

- A The student finds the correct fraction and checks this answer. (1.5 points)
- B The student finds the new correct fraction and checks this answer. (1.5 points)
- C The student creates a correct visual fraction model. (1 point)

**Overall**, the student earns 4 points.





## Annotated Student Response

## SAMPLE 3-POINT RESPONSE

## NOTES

3.

A) Andy used  $\frac{1}{20}$  of the cafeteria floor for his paintings. I know this because the painting is in  $\frac{1}{4}$  of Andy's reserved space, which is  $\frac{1}{5}$  of the whole thing. So we would find what fraction of the cafeteria Andy used for paintings by finding  $\frac{1}{4}$  of  $\frac{1}{5}$ . We would do this by multiplying  $\frac{1}{4}$  by  $\frac{1}{5}$ . The product is  $\frac{1}{20}$ .

Ex.  $\frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$

1.5

B) Andy used  $\frac{1}{12}$  of the cafeteria floor for his paintings. I know this because Andy's reserved space is  $\frac{1}{3}$ , and he put his painting in  $\frac{1}{4}$  of his reserved space. With this information we would figure it out the same way we did in part A. The product of  $\frac{1}{4}$  times  $\frac{1}{3}$  is  $\frac{1}{12}$ , so he used  $\frac{1}{12}$  of the cafeteria for paintings. Ex.  $\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$

Paintings  $\frac{1}{12}$

C)

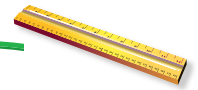
Paintings

Andy's reserved space  
 $\frac{1}{3}$

1.5

.5



**ANNOTATION –3-POINT RESPONSE**

- A The student finds the correct fraction and checks this answer. (1.5 points)
- B The student finds the new correct fraction and checks this answer. (1.5 points)
- C The student creates a partially-correct visual fraction model. (0.5 point)

**Overall**, the student earns 3.5 points.



## Annotated Student Response

## SAMPLE 2-POINT RESPONSE

## NOTES

3.

A. Randy used  $\frac{1}{20}$  of the floor space for his paintings in the cafeteria. How you can use multiplication is you can multiply  $\frac{1}{5}$  by 4, I can do that because which is the  $\frac{1}{5} \times \frac{1}{4} = \frac{1}{20}$  answer.

A

1.0

B. Randy used  $\frac{1}{12}$ .

B

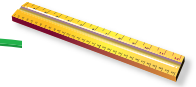
.5

It is  $\frac{1}{12}$ . Because if you count all the pieces you have 12 and the paint is used once so that is why.

C.  $\frac{1}{12}$  is the visual fraction.  $\frac{1}{12}$  of part B in the painting.

C

1.0

**ANNOTATION – 2-POINT RESPONSE**

A The student finds the correct fraction and checks this answer, but part of the explanation is incorrect. (1 point)

B The student finds the new correct fraction but provides an incomplete explanation that does not explain why the model gets divided as shown. (0.5 points)

C The student creates a correct visual fraction model. The student clearly indicates that the model was provided in part B. (1.0 points)

**Overall**, the student earns 2.5 points.





## Annotated Student Response

## SAMPLE 1-POINT RESPONSE

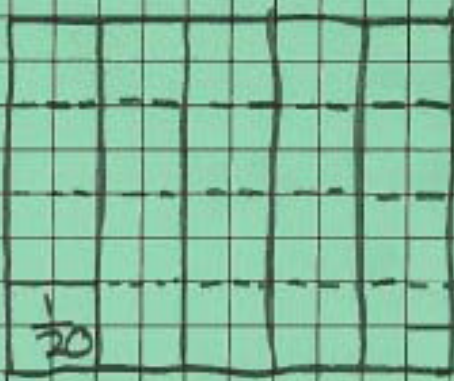
## NOTES

3.

(A) The cafeteria floor space that Andy used for paintings was  $\frac{1}{20}$  of the floor. I know that it is one twentieth of the the floor because if you spaced she used you count the other pieces of space from all of the cafeteria.

(B) Andy used  $\frac{1}{20}$  because if you draw a picture you are able to see if you add all of the spaces even counting the space that she is not using the space

(C) A visual fraction model to show the fraction of the cafeteria is



A

.5

B

0.0

C

0.0



## GRADE 5 —Mathematics

**ANNOTATION – 1-POINT RESPONSE**

- A The student finds the correct fraction but gives no explanation. (0.5 points)
- B The student repeats the answer from Part A and does not find the correct new fraction. (0 points)
- C The student creates a visual fraction model for  $\frac{1}{20}$  instead of  $\frac{1}{16}$ . (0 points)

**Overall**, the student earns 0.5 point.



## Annotated Student Response

### SAMPLE 0-POINT RESPONSE

### NOTES

3.

A. Andy reserved  $\frac{1}{5}$  of space

B. Andy used  $\frac{4}{5}$  of space  
4 paintings

C. Andy used  $\frac{4}{5}$  of space  
4 paintings

A

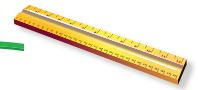
0.0

B

0.0

C

0.0



## GRADE 5 —Mathematics

**ANNOTATION – 0-POINT RESPONSE**

- A The student does not find the correct fraction. (0 points)
- B The student does not find the new correct fraction. (0 points)
- C The student creates an incorrect visual fraction model. (0 points)

**Overall**, the student earns 0 points.

## Item Information

Question Number	Key	DOK*	KCAS Primary Standard**
1	C	1	5.NBT.2
2	C	2	5.G.4
3	A	2	5.NF.1
4	B	1	5.MD.5a
5	A	1	5.NBT.3b
6	NA	2	5.OA.2
7	NA	3	5.OA.2
8	NA	3	5.NF.7a

\*DOK is the abbreviation for Depth of Knowledge. Please note that DOK is associated to the complexity level of an assessment item and is not aligned to the standard. Further information regarding DOK can be accessed on the Kentucky Department of Education website: <http://www.education.ky.gov/kde/instructional+resources/curriculum+documents+and+resources/core+content+for+assessment/core+content+for+assessment+4.1/content+specific+core+content+for+assessment+dok+support+materials.htm>.

\*\*Further information regarding Common Core Standards can be accessed on the Common Core website: <http://www.corestandards.org>.